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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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EXAMINER


QI, ZHI QIANG

ART UNIT PAPER NUMBER

2871

DATE MAILED: 09/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|------------------------------------------------------------------------------------|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/796,375 | KIM ET AL. | |
| | Examiner | Art Unit |  |
| | Mike Qi | 2871 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-9, 11, 14-18 and 21-29 is/are rejected.
- 7) ☒ Claim(s) 10, 12, 13, 19, 20 and 30-32 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 3-4, 18, 23 and 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 3-4 and 23, recitation “. . .the reflective electrode covers the sidewall and the organic layer” , “. . .the transparent electrode covers the transmissive region, the sidewall and the organic layer” and “. . .the transparent electrode covers the organic layer in the reflective region”. However, according to the Fig.4, the reflective electrode (213) and the transparent electrode (212) do not cover the organic layer (214), but the reflective electrode (213) and the transparent electrode (212) overlaps the organic layer (214). For examination purposes, it is interpreted as the reflective electrode and the transparent electrode overlap the organic layer.

Regarding claim 25, recitation “. . .the organic layer covers the transparent electrode”. However, according to the Fig.10, the organic layer (314) do not cover the transparent electrode (312), but the organic layer (314) overlaps the transparent electrode (312). For examination purposes, it is interpreted as the organic layer overlaps the transparent electrode

Claim 18 recites the limitation "the gate electrode is located in the first region" in claim 17. There is insufficient antecedent basis for this limitation in the claim 17. The

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claim 17 describes a reflective region. Therefore, "the first region" in the claim 18 should be - -the reflective region - -.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-7, 9, 11, 14-15 and 22-29 are rejected under 35 U.S.C. 102(b) as being anticipated by US 6,330,047 B1 (Kubo et al).

Regarding claims 1, 22 and 26, Kubo discloses (col.3, lines 9-23; col. 12, line 45 – col.15, line 39; Figs.1-2) that a display apparatus comprising:

- substrate (upper substrate 9);
- transparent electrode (transparent conductive film 21);
- liquid crystal layer (25) located between the substrate (upper substrate 9) and the transparent electrode (21); and the liquid crystal layer (25) having reflective region, transmissive region, and an interface region between the reflective region and the transmissive region (even though the interface region is a contact hole area, the function is an interface for electrical coupling);

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- thin film transistor (4) being electrically coupled to the transparent electrode (21) through an electrical coupling in the interface region (between the reflective region and the transmissive region);

(concerning claims 22 and 26)

- the array substrate (11) having reflective region, transmissive region, and interface region between the reflective region and the transmissive region;
- thin film transistor (4) formed in the reflective region of the second substrate (11);
- organic layer (19) forms sidewall in the interface region (between the reflective region and the transmissive region, even though the interface region is a contact hole area, the function is an interface for electrical coupling);
- transparent electrode (21) deposited over the thin film transistor (4) and coupled to the thin film transistor (4) in the interface region (between the reflective region and the transmissive region).

Regarding claims 2 and 27, Kubo discloses (Figs.1-2) that reflective electrode (22,23) positioned in the reflective region (22) (depositing reflective electrode 22,23 on the organic layer 19 in the reflective region) and the interface region (between the reflective region and the transmissive region), and the reflective electrode (22,23) is electrically coupled to the thin film transistor (4) in the interface region.

Regarding claims 3-6, 23 and 28, Kubo discloses (col.4, lines 20-21; Figs.1-2) that an organic layer (19) positioned between the reflective electrode (22,23) and the thin film transistor (4), and the organic layer (19) forms sidewall in the interface region

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(between the reflective region and the transmissive region, even though the interface region is a contact hole area, the function is an interface for electrical coupling) and the reflective electrode (such as 22) covers the sidewall, and overlaps the organic layer (19) in the reflective region; and the transparent electrode (21) covers the transmissive region, the sidewall and overlaps the organic layer (19) (the transparent electrode 21 is deposited on the organic layer 19), and the transparent electrode (21) is located between the reflective electrode (22,23) and the thin film transistor (4); and inherently, the organic layer (19) having a patterned surface and the reflective electrode (such as 22,23) is conformally coated on the patterned surface.

Regarding claim 24, Kubo discloses (Figs.1-2) that reflective electrode (22,23) deposited on the organic layer 19 in the reflective region, and the reflective region (22,23) being electrically coupled to the transparent electrode (21).

Regarding claims 7, 25 and 29, the limitation corresponding to Fig.10 of this application, Kubo further discloses (col.45, line 29-52; Fig.54) that the transparent electrode (302) is in the reflective region (327), the transmissive region (326) and the interface region (the contact hole region 317 functions as interface region for electrically coupling), and the transparent electrode (302) in the reflective region (327) is overlapped by the organic layer (303) (the organic layer 303 is deposited on the transparent electrode 302 in the reflective region 327).

Regarding claims 9 and 11, Kubo discloses (Figs.1-2) that the thin film transistor (4) comprises gate electrode (12), source electrode (15) and drain electrode (16), and the gate electrode (12) is located in the reflective region and the drain electrode extends

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from the reflective region to the interface region to form an interface electrode (such as the connecting electrode 5 functions as interface electrode) that forms the electrical coupling with the transparent electrode (21), and extends across the interface region.

Regarding claim 14, Kubo discloses (Figs.1-2) that the reflective region (22) and the transmissive region (20) are located in a pixel region which is defined by signal lines (such as data line 3 and gate line 2).

Regarding claim 15, Kubo discloses (col.18, lines 113-17; Fig.9) that using color filter (53) coupled to the upper substrate for achieving color display.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 16-18, 21 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kubo in view of US 2005/0024559 A1 (Okumura).

Regarding claims 16 and 17, Kubo teaches the invention set forth the above.

Kubo lacks that an organic layer having a first thickness (first cell gap) in the reflective region and a second thickness (second cell gap) in the transmissive region, and forming a sidewall in the interface region in which the height of the sidewall is approximately equal to the difference between the two thickness.

Okumura discloses (paragraphs 0047-0048; Fig.3B) that an organic layer (26)

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having a first thickness in the reflective region (R) and a second thickness in the transmissive region (T), such that the cell gap of the liquid crystal layer (50) in the transmissive region (T) is approximately twice of the cell gap of the liquid crystal layer (50) in the reflective region (R), and forming a sidewall in the interface region (sloping area 26a) in which the height of the sidewall is approximately equal to the difference between the two thicknesses. Okumura indicates (paragraph 0048) that such organic layer (26) serves as a liquid crystal layer-thickness adjusting layer to vary the thickness of the liquid crystal layer (50) so as to obtain a high contrast display.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to modify the display apparatus of Kubo with the teachings of the organic layer having different thicknesses and a sidewall in the interface region as taught by Okumura, since adjusting the retardation in the reflective region (R) and the retardation in the transmissive region (T) being substantially equal to each other, so as to obtain a high contrast display (see paragraph 0048).

Regarding claim 18, Kubo discloses (Figs.1-2) that the thin film transistor (4) comprises gate electrode (12), source electrode (15) and drain electrode (16), and the gate electrode (12) is located in the reflective region and the drain electrode extends from the reflective region to the interface region to form an interface electrode (such as the connecting electrode 5 functions as interface electrode) that forms the electrical coupling with the transparent electrode (21), and extends across the interface region.

Regarding claim 21, Kubo discloses (Figs.1-2) that reflective electrode (22,23)

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deposited on the organic layer 19 in the reflective region (between the reflective region and the transmissive region).

Regarding claim 8, Kubo teaches the invention set forth the above. Kubo lacks that the reflective electrode comprises silver layer or silver alloy layer or molybdenum-tungsten alloy layer or aluminum-neodymium layer.

Okumura discloses (paragraph 0046) that reflective electrode (reflective film) formed out of a metal film having a high reflectivity, such as silver. All of the metal film such as silver alloy layer or molybdenum-tungsten alloy layer or aluminum-neodymium layer having a high reflectivity.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to modify the display apparatus of Kubo with the teachings of the reflective electrode using metal reflective electrode as taught by Okumura, since all of the metal film having a high reflectivity (see paragraph 0046).

Allowable Subject Matter

7. Claims 10, 12-13, 19-20 and 30-32 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record neither discloses nor teaches that a display apparatus comprising various elements as claimed, more specifically, as the following:

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the interface electrode is shaped and positioned to prevent light leakage in the interface region; the interface electrode is located at the border of the reflective region, the transmissive region and the interface region; and the shape and the position of the interface electrode are adjusted according to a rubbing direction for the apparatus [claims 10, 12-13, 19-20 and 30-32; as shown in Fig.3-4].

The closest references Kubo and Okumura disclose a liquid crystal display apparatus having reflective region, transmissive region and coupling area functions as interface region. However, the prior art of record do not disclose such interface electrode wherein the shape and the position being adjusted according to a rubbing direction of the display apparatus and being formed in the interface region to prevent light leakage in the interface region.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mike Qi whose telephone number is (571) 272-2299.


The examiner can normally be reached on M-T 8:00 am-5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mike Qi
September 8, 2005


ROBERT KIM
SUPERVISORY PATENT EXAMINER